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Online Report of Army Aircraft Mishaps

"For they had learned that true safety was to be found in long previous training, and not in eloquent exhortations uttered when they were going into action."
— Thucydides, The History of the Peloponnesian War, c. 404 BC

Everything on paper appears perfect. Your team has applied composite risk management impeccably, the environmental hazards have been identified, and your crew selection of experienced personnel shows a depth of leader involvement and oversight of the mission approval process. Yet, the mission still results in a mishap. How does this happen? Perhaps the support, training, or preparation leading up to the mission — sometimes stretching back for months, if not years — could have made a difference. Some recent studies suggest that standards and training are key to preventing mishaps, especially in degraded visual environments (see article on page 2).

The Air Task Force, especially in the last month, has taken a hard look at technological solutions for risk mitigation, as well as processes such as the Aviation Safety Awareness Program (ASAP). Next month, we'll describe ASAP, the results of the beta test and the way forward with an operational test that begins in January 2012.

Also in this issue, DES is providing an overview of pending changes to the "Before Landing Check" procedure (page 4). Flight crews continue to operate in a combat environment of high altitude, high temperatures and at higher gross weights. Unfortunately, we are still repeating the same mistakes, such as pilots maneuvering their aircraft into unusual attitudes or experiencing excessive drift, or contact with adjacent aircraft or obstacles. Commanders must understand that these skills are critical to saving lives in combat and when the unit returns to home station.

These initiatives take time to develop, approve, and implement. Yet, some timeless risk mitigation is available to every commander — training and preparation. Spikes in accidents at the onset of OIF and noticeable decreases thereafter may indicate the positive effects of TTPs and training for that environment.

The "Blast from the Past," which only reaches back to 2004, reminds us that for IIMC, "continuation training … is critical to building the confidence of aviators who encounter this situation." Today, we'd probably expand that to "confidence and proficiency," but the lesson is an important reminder.

The observation from Thucydides, that true safety can be found in long previous training, is also an important lesson and reminder that through training and standards, commanders can influence and reduce risk every day.

Until next month, fly safe! LTC Christopher Prather, Director, Air Task Force, email: christopher.prather@us.army.mil

Standards and Training Key to Preventing Mishaps in Degraded Visual Environments

Many lessons can be learned from a recent study of helicopter losses from 2002 - 2010. The study, which is still pending formal approval, addressed loss rates and causal factors and provided a list of candidate solutions for reducing rotorcraft losses. One lesson we learn, and that can be applied immediately in the field, is that Commanders can influence successful mission support in degraded visual environments (DVE) through training and adherence to standards.

Consider the following data points:

- From a worldwide perspective, 98 Class A and B DVE and controlled flight into terrain (CFIT) accidents accounted for 104 fatalities and a loss of $930M from FY02 through FY10.

- DVE and loss of situational awareness were the principal contributing factors to Class A and B accidents from FY02 through June FY10.

- DVE mishaps occurred most frequently in the lift and cargo fleets during sustained combat missions in a mature theater. For the Attack and Scout fleets, DVE mishaps occurred most frequently during expeditionary missions at the onset of combat operations.

Clearly when considering mishaps in degraded visual environments, especially during combat operations, additional effort is required to protect our Soldiers and preserve our combat power. There are robust ongoing efforts at the Department of Defense to find technological mitigations in degraded visual environments for all services; yet technological mitigations enhance, not replace, training and aircrew proficiency – as highlighted in an Associated Press release in August entitled "Automation in the air dulls pilot skill" which can be read at:

http://www.google.com/hostednews/ap/article/ALeqM5gdmYSGPD7TdQa-QsiKHXDoTd_uaA?docId=a4e56bdd941949d9b5f711277b56bdf5

Coupled with the following report findings that some additional focus on aircrew training and proficiency in DVE operations, this indicates room for improvement in preparation of conducting operations in new environments and Inadvertent Instrument Meteorological Conditions (IIMC).

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Analysis of aircrew training and proficiency factors revealed:

- At the onset of the 2003 offensive into Iraq, a noticeable "spike" in accidents occurred during the mobilization and initial invasion. Factors that contributed to these accidents may be linked to inadequate aircrew training for operations in new environments or expeditionary missions.

- Two-thirds of the hazard mitigation recommendations for this period include a training component on the DVE and Loss of Situational Awareness hazards identified for the Utility and Cargo fleets.

- Inadvertent Instrument Meteorological Condition (IIMC) accident case analysis reveals a consistent trend of mishaps attributed to flights into and within IMC. An astonishing fact is that flight crews often failed to properly execute the IIMC procedures correctly and commit to instrument flight.

- The accident data indicates the majority of the limited visibility (IIMC) accidents occurred during night operations under use of night vision devices.

- Currently, the use of the Heads-Up Display (HUD) is not mandatory for flight operations in the Cargo and Lift community.

These findings underscore the criticality of training and proficiency in DVE operations (for example hazard analysis). Spikes in accidents at the onset of OIF and noticeable decreases thereafter may indicate positive effects of TTPs and training for that environment. Since many garrison and home stations do not have DVE training facilities, use of simulators with DVE programs should be considered by Commanders for interim training for future operations into environments.

To better prepare your crews for degraded visibility conditions and IIMC, we recommend, based upon review of this report, placing additional emphasis on aircrew DVE training both in-flight and in simulators, focusing on training to standards, piloting in accordance with Aircrew Training Manuals, adhering to policies, and training as you fight. Continuation flight training should include additional training for Instrument Meteorological Conditions / Inadvertent Instrument Meteorological Conditions (IMC/IIMC) and the use of the Heads-up Display (HUD).

Performance Considerations – As Required

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In the past decade, Army aviators have responded to our nation's needs in uncertain and high-risk environments by deploying many times to Iraq and Afghanistan. Flight crews routinely perform complex tasks and missions while operating in environments of high altitude, high temperatures and at higher gross weights. Exposure to these environments has been a learning experience for our community. Unfortunately, we are still repeating the same mistakes.

One of the causal factors most often cited by accident investigation findings is crew error or complacency in power management awareness. In this context, consider power management to include the entire spectrum of factors and influences affecting the aircraft's ability to overcome gravity. This article is not intended to restate the training aspects that all Army aircrews should be aware of through routine pre-deployment training events. My intent is to explain an initiative undertaken by the Directorate of Evaluations and Standardization (DES) to address the trend in a more direct manner.

The Army is already teaching aviators how to fly confidently in Afghanistan, emphasizing power management and wind current navigation at the High Altitude Mountain Environmental Training (HAMET) and at the Colorado National Guard's High Altitude Army Training Site (HAATS). Pilots address individual and collective training repetitively in Readiness Level Progression and collective training events. However, while aviators are receiving essential and valuable training, Army aviation continues to experience an inordinate number of aircraft performance-related accidents.

DES has initiated a change to all currently fielded Army rotary-wing aircraft operators' manuals and checklists. This modification is quite simple in the broader sense, yet designed to create a mandatory crew event triggered at a critical time in the flight profile. In the next or near term change publishing cycle, the change will be an addition to the last step of the -10 checklist "Before Landing Check" for all MDS's (Mission Design Series). The text will be the same for all rotary wing airframes, in order to highlight the aerodynamic situation applies to all.

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The checklist change publications will include the addition of the step "Performance Considerations – As required." This addition will be the last step of the Before Landing Check. The goal is to serve as a standardized crew action to influence consideration or awareness of aircraft and environmental performance considerations that could negatively affect the transition from an en route phase of flight to the arrival phase. Because this additional step is now to be included in the Before Landing Check, the reminder or annunciation of the check will occur with each approach or transition the aircrew initiates to approach to land or hover.

The intent of the check is not to imply the aircrew must entirely re-compute their arrival performance planning card (PPC) data. Rather, the additional check is intended to highlight the fact that the crew should consider the situational factors affecting power management prior to arrival or transitioning below effective translational lift with each transition; such as, aircraft power available (IGE and OGE), power required, wind direction and speed, obstacles, gross weight, surface condition, rising terrain, escape or go-around plan, etc.

By augmenting this step in the operator's manual, it effectively removes it from the realm of optional training considerations or tactics, techniques and procedures. It now becomes a required crew action check. DES hopes this simple checklist modification will serve to alert future crews to apply essential consideration to performance factors prior to arriving in a compromising arrival or pre-landing situation and potential accident scenario.

The Before Landing Check does vary by MDS, but here's the AH64 with the new addition as step #5 for example:

BEFORE LANDING CHECK

1. **Weapon Systems – Safe**
2. **ASE – As required**
3. **TAIL WHEEL button – Lock**
4. **PARK BRAKE – As Required**
5. **PERFORMANCE CONSIDERATIONS – As required**

Mishap Review: CH-47F NVG Extraction

While conducting a two-ship NVG approach to extract ground forces, chalk 2 impacted the ground approximately 1 NM short of the PZ, heavily damaging the right side of the aircraft and shearing the aft pylon. The crew received minor injuries.

History of flight

The accident crew's show time was 2000 hours. The mission was an insertion of two small team units into separate locations with the aircraft staging for on-call extractions later in the evening. The crews completed aircraft preparation and conducted mission and crew briefs. Weather was VMC with 12 knot winds from the east, temperature of 23 degrees C, scattered clouds at 9000 MSL and a broken layer at 20,000. Forecast visibility was 5000 meters with zero illumination. The crew was familiar with each other and had been battle rostered together for over a month.

At 2330 hours the flight of 2xCH and 2xAH departed their FOB en route to the first objective. Insertions were complete shortly after 0100 hours and the flight moved to an intermediate location to stage for the on-call extractions. At 0325 the flight departed to extract the first element at the first objective. During the final inbound course to the PZ for the exfil at Objective 1, the PC moved the aircraft into a trail formation and began a descent from 500 feet AGL/100 kts. During the progressive deceleration, the aircraft pitch varied from an initial nose high of approximately 15 degrees to nearly 22 degrees as the airspeed zeroed out at 165 feet AGL. The aircraft descended rapidly from this low power, low airspeed OGE condition. At 100' AGL, the "low altitude" warning alerted the remainder of the crew to the conditions as the pilot on the controls initiated an aggressive thrust response to stop the descent. The aircraft continued its descent until impacting the ground, heavily damaging the right side of the aircraft and shearing the aft pylon. The crew suffered two minor injuries.

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Crewmember experience

The PC had more than 630 hours total flight time, 550 in the CH-47D/F, 260 NVG and 50 hours as a PC. This was his first combat deployment accumulating over 300 hours. The AMC/co-pilot had over 2000 hours flight time, 1900 in the CH-47D/F, 1100 NVG, 1200 hours combat time and more than 1000 hours as an IP. The experienced FEs in the left and right doors had more than 1200 and 800 hours respectively.

Commentary

The accident board determined that while conducting a hasty air assault at night in low illumination conditions, the crew of the CH-47F, in trail position of a flight of two, failed to maintain a proper scan. The PC and AMC/PI became fixated on lead and actions in the vicinity of the PZ and maneuvered the aircraft into an unperceived OGE hover condition at a low power setting with an excessive upwards pitch. The aircraft descended rapidly, impacting aft first with a significant right roll. The impact caused minor injuries to the crew and separated the aft pylon from the aircraft.

Terminology

Controlled Flight Into Terrain (CFIT). A mishap where an airworthy aircraft, under pilot control, inadvertently flies into terrain, water, or an object. This does not include incidents where there is intent to land, object/wire strikes, or the aircraft departs controlled flight.

Degraded Visual Environment (DVE). The Army defines DVE as an environment of reduced visibility of potentially varying degree, wherein situational awareness and aircraft control cannot be maintained as comprehensively as they are in normal Visual Meteorological Conditions (VMC) and can potentially be lost. This description of DVE is applicable to all regimes of flight.

Selected Aircraft Mishap Briefs

Information based on Preliminary reports of aircraft mishaps reported in August 2011.

Utility helicopters

UH-60

- A series. Crew was landing for patient pickup when the left landing gear settled into soft terrain, resulting in the main rotor blades contacting rising terrain. (Class B)

- L series. Post-flight inspection revealed that the APU door was missing, presumably separating in flight. Damage was observed to the No. 1 engine cowling, No. 1 HIRRS cowling, and blue and black main rotor blades. (Class C)

Attack helicopters

AH-64D

- Aircraft experienced a No. 1 engine failure during takeoff. Crew executed a forced landing, touching down on a dirt berm. Aircraft sustained minor damage to the L330 panel and antenna. (Class C)

- Crew encountered rising terrain and diminished visibility. During landing, aircraft touched down on rocky terrain, damaging the tail boom and stabilator. (Class B)

- Aircraft experienced an over-torque condition (135%/5 sec) during single engine operation. (Class C)

- On post-flight inspection, damage was discovered to main rotor tip cap and tail rotor following range operations. (Class C)

Observation helicopters

TH-67A

- Crew experienced a chip detector light, followed by engine failure during climbout. IP conducted an autorotation to the stagefield and the aircraft made ground contact, resulting in separation of the aft portion of the tailboom, vertical fin, and the tail rotor gearbox. (Class C)

OH-58D

- Crew experienced a bird strike on final approach for landing. Damage incurred to the MMS, transmission, driveshaft, tail rotor gearbox, and all four main rotor blades. (Class C)

AH-6M

- Aircraft descended into trees and crashed during range training. Both crewmembers sustained fatal injuries as a result. (Class A)

Cargo helicopters

CH-47

- D series. Aircraft contacted a dirt mound during a roll-on landing and sustained damage to the left rear landing gear, hydraulic lines, and surrounding sheet metal. (Class C)

- D series. During landing to unimproved area, the left forward main landing gear struck a large rock, causing damage. (Class C)

- F series. On short final of an NVG approach, aircraft entered an uncontrolled descent and landed hard, resulting in separation of the aft rotor assembly/transmission. (Class A)

- F series. Aircraft sustained damage from forklift forks during hot cargo load operations. (Class C)

Unmanned Aircraft Systems

RQ-7B

- The UA experienced an ignition and generator failure at 9,000 feet MSL. The UA descended to ground impact and was recovered. (Class C)

- UA experienced engine temp and RPM spikes. Crew elected to return the UA to base. During landing sequence, the generator failed and the UA crashed. (Class C)

- While in a holding pattern, the UA collided with a C-130. Damaged was incurred to both aircraft. (Class A)

- UA's landing gear collapsed upon touchdown with the payload and undercarriage sliding off the runway and impacting terrain. (Class C)

FY 11 Manned Aircraft Class A – C Mishap Table										
	Month	FY 10					FY 11			
		Class A Mishaps	Class B Mishaps	Class C Mishaps	Army Fatalities		Class A Mishaps	Class B Mishaps	Class C Mishaps	Army Fatalities
1st Qtr	October	4	1	3	1		0	1	3	
	November	1		5	2		0	2	12	
	December		1	4			2	1	4	4
2nd Qtr	January		2	3			0	0	7	
	February	2	2	9	5		0	2	2	
	March	2		4			2	1	5	
3rd Qtr	April	2	1	5	1		2	1	9	
	May	1	2	2	1		2	2	2	1
	June	6		5	1		3	1	3	2
4th Qtr	July	1	2	4			2	2	7	2
	August	2	2	5			2	2	9	2
	September	2	1	5	5					
	Total for Year	23	14	54	16	Year to Date	15	15	63	11

As of 1 Sep 11

Preliminary Loss Report (PLR)

ARMY PRELIMINARY LOSS REPORT 11130

AH-6M CRASH CLAIMS TWO SOLDIERS' LIVES

Two 160th Special Operations Aviation Regiment, Fort Campbell, Kentucky Soldiers were fatally injured in an AH-6M helicopter crash that occurred on 8 August 2011 at approximately 1500 local at Fort Benning, Georgia. The pilots (30-year-old CPT and 37-year-old CW3) died after their AH-6M Little Bird helicopter crashed while conducting training. The pilots were evacuated to a local medical center where they passed away from their injuries. A Centralized Accident Investigation (CAI) team from the US Army Combat Readiness/Safety Center is investigating. USASOC News Release

These are the **10th** and **11th** Class A **Aviation** fatalities in FY11 compared to **14** for the same time frame in FY10. This PLR does not identify specific root causes of this incident as the investigation is ongoing. Further details will be available at a later date on RMIS (RMIS Login Required).

Preliminary Loss Reports (PLR) are ***For Official Use Only*** and are to provide leaders with awareness of Army loss as we experience it and to point out potential trends that affect our combat readiness.

Our Army depends on you to use these PLRs to help Soldiers understand the impact of decisions made on and off duty.

The **U.S. ARMY COMBAT READINESS/SAFETY CENTER** is interested in your comments; please click here to provide feedback on the Preliminary Loss Reports (PLR). FAQs Additional resources can be found in Knowledge, the official safety magazine of the U.S. Army.

FY 11 UAS Class A – C Mishap Table

	FY 10 UAS Mishaps					FY 11 UAS Mishaps			
	Class A Mishaps	Class B Mishaps	Class C Mishaps	Total		Class A Mishaps	Class B Mishaps	Class C Mishaps	Total
MQ-1	2		1	3	W/GE	1		1	2
MQ-5	3			3	Hunter	3		1	4
RQ-7		14	21	35	Shadow	1	8	25	34
RQ-11					Raven			1	1
RQ-16A			1		T- Hawk			2	2
MQ-18A	1								
SUAV								1	1
Aerostat		2	2	4		6	9		15
Total Year	6	16	25	46	Year to Date	11	17	31	59

As of 1 Sep 11

A Failure to Communicate + IIMC = Tragedy

reprinted from Flighfax Feb 04

Inadvertent instrument meteorological conditions (IIMC) break-up procedures are often one of the most overlooked aspects of air mission planning and rehearsals. Whether a unit is conducting a mission or continuation training, IIMC break-up procedures seldom receive the emphasis necessary to ensure the safe and successful return of flight crews.

The mission was to conduct night extraction training of four six-man teams from a long-range surveillance (LRS) unit preparation. The concept of the operation was for two UH-60As, under night vision goggles (NVGs), to conduct a link-up with a two-man LRS control team. After the link-up and final coordination, the aircraft would depart with the two-man control team en route to a notional landing zone (LZ). After completing the insertion, the aircrew would loiter at a predetermined location until it was time to extract the teams. The unit that assigned the mission was a command aviation group company, with the primary mission of command and control, VIP support, and personnel recovery. The crew received the weather forecast from a weather briefing flimsy approximately 4 hours prior to the flight. The forecast called for minimum ceilings at 3,000 feet, minimum visibility 2 miles, and winds 120 degrees at 20 knots, gusting to 22 knots, with blowing dust and isolated thunderstorms for the planned area of operation. However, unknown to the crew, their weather flimsy had been replaced but wasn't on file in the tactical operations center. The flimsy forecast of minimum ceilings and visibility remained largely unchanged, with the exception of light rain showers and thunderstorms were added as a visibility restriction. In addition, the incidence of thunderstorms was changed from isolated to few.

Prior to departing for the mission, the airfield's tactical tower received a pilot weather report (PIREP) from a CH-47 flight that informed them they had encountered IIMC and declared an emergency. After landing, the pilot in command (PC) of the lead Ch-47 submitted a PIREP to their weather detachment at 2315 of ceilings reported at 400 feet above ground level (AGL). The PIREP was recorded by weather personnel, but was not disseminated to the Joint Army/Air Force Weather Information Network or to the accident aircraft's weather detachment. Additionally, a returning AH-64D transmitted a PIREP to the tactical tower indicating that instrument flight rules (IFR) conditions existed in the local area. While the UH-60 flight was taxiing to the runway, they heard the AH-64D crew relay the PIREP and were notified by tower that the field was operating under

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Blast From The Past

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IFR. The lead UH-60 requested a special visual flight rules (SVFR) departing to the south.

At 0010, the flight of two UH-60As departed the airfield. Approximately 10 minutes into the flight with an en route altitude of 100 feet AGL, Chalk 1 began to enter decreased visibility and announced to his aircrew that he was initiating IIMC procedures. The lead aircraft began a climbing left turn; however, Chalk 2, unaware of what Chalk 1 was doing, continued along the route of flight. Shortly after Chalk 1 initiated IIMC break-up, Chalk 2 impacted the ground. The aircraft was destroyed, and all personnel were fatally injured.

Lessons Learned

The preliminary investigation revealed support, training, leader, and environment as contributory factors to this accident; planning and communications were critical to the outcome. Although all factors contributed, one might have prevented the accident – briefing and rehearsing IIMC break-up procedures.

*** Support.** The weather distribution process must be linked for all operational units, regardless of boundaries. In this case, two separate aviation brigades had weather reporting assets; however, weather information from one aviation brigade weather team was not being disseminated to other weather detachments. As such, critical PIREPs were not relayed to the flight crew. In areas with remote weather reporting capability, it is incumbent upon aircrews to provide the necessary observations to assist weather personnel in updating weather conditions. However, the chain does not stop there. Aviation flight operations elements must ensure that all weather data is received from all sources of information, and this information must be available to the aircrews.

*** Training.** Continuation training that incorporates IIMC procedures is critical in building the confidence of aviators who could encounter this situation. Too often, IIMC can be viewed negatively; a common remark when discussing IIMC procedures is, “Don’t go IIMC!” Unfortunately, it is not that easy. Single- and multi-ship IIMC procedures should be incorporated into all training plans and missions. In this accident, the unit was accustomed to operating single-ship missions; consequently, the aircrews were not proficient in multi-ship operations, let alone IIMC break-up procedures.

*** Leader.** Leaders at all levels must be part of the planning process through mission execution. Without this involvement, leaders are unable to make informed risk decisions that can affect the outcome of the mission. In this case, company and battalion leaders were not involved in the air mission brief. They both received an overview of the mission, but were more than likely unaware that IIMC break-up procedures were not planned or briefed.

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*** Planning.** As with any mission, planning and performing rehearsals are a crucial element to facilitate the successful outcome of the mission. The key element that was lacking in this mission was the IIMC break-up plan.

*** Communication.** In three separate incidents, two single factors – vague instruction and a lack of communication – contributed to the outcome of this mission. In the first incident, the lead CH-47 PC informed the tactical tower of the weather conditions and submitted a PIREP to their weather detachment. Although the PIREP was recorded by weather personnel, a vital communication breakdown occurred when the PIREP was not passed on to the accident aircraft's weather detachment or the Joint Army/Air Force Weather Information Network.

Shortly afterward, the AH-64D crew submitted a PIREP to the tactical tower and assumed the weather information would be relayed to the following flights. However, tower operators misunderstood this request and never relayed the weather situation to the UH-60 crew.

The last communication breakdown occurred when the UH-60 flight lead announced his intentions to initiate IIMC procedures to his aircrew only. At no time was the execution of IIMC break-up ever relayed to Chalk 2.

-MAJ Ron Jackson, USASC, February 2004 issue of Flightfax

U.S. ARMY COMBAT READINESS/SAFETY CENTER

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